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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,839	11/12/2003	Jong Sik Paek	GK0005	9506

7590 06/20/2005

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EXAMINER

WEISS, HOWARD

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 06/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/712,839	PAEK ET AL.	
	Examiner	Art Unit	
	Howard Weiss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 21-25 ~~is~~ are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 21-25 ~~is~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0204, 0105, 0405</u> | 6) <input type="checkbox"/> Other: _____ |

Attorney's Docket Number: GK0005

Filing Date: 11/12/03

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Paek et al. (Kim, Seo)

Examiner: Howard Weiss

Election/Restrictions

1. Applicant's election without traverse of the Group I invention, Claims 1 to 15 and 21 to 25 (new), in the reply filed on 4/26/05 is acknowledged. Claims 16 to 20 have been canceled.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 21 to 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Hoffman (U.S. Patent No. 6,603,183).

Hoffman show all aspects of the instant invention (e.g. Figure 1) including:

- an image sensor die **108** with a photo sensing surface **112** and bond pads **114** and a non-photo sensing surface **108L**

- an insulative layer **104,106** extending over a side surface of side sensor die and attached to the non-photo sensing surface via an adhesive **110**
- a window in said insulative layer (between side **106I**) covered with a glass **130**
- electrically conductive patterns **108,116,122,120** extending over said sides of said die and connecting solder balls **126** to said bond pads via holes **122A** in said insulative layer
- an encapsulant **119** encapsulating said conductive patterns and said bond pad but not covering said photo sensing surface

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1 to 5, 7 to 12, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman and Tu et al. (U.S. Patent No. 6,559,539).

Hoffman shows most aspects of the instant invention (Paragraph 4) except for the memory die attached to the non-photo sensing surface and conductive bumps

interposed between the memory die and conductive patterns. Tu et al. teach (e.g. Figure 3) to attached a memory die **22** to the non-photo sensing surface of an image sensor die **26** and to put conductive bumps **36** interposed between the memory die and conductive patterns **16** to lower costs (Column 3 Line 64 to Column 4 Line 11). It would have been obvious to a person of ordinary skill in the art at the time of invention to attached a memory die to the non-photo sensing surface of an image sensor die and to put conductive bumps interposed between the memory die and conductive patterns as taught by Tu et al. in the device of Hoffman to lower costs.

7. Claims 6 and 13 to 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman and Tu et al., as applied to Claim 21 above, and further in view of Komiyama (U.S. Patent No. 6,329,708).

Hoffman and Tu et al. show most aspects of the instant invention (Paragraph 6) except for the first curved portion having a curvature on the side of said image sensor die and second memory die attached as claimed. Komiyama teaches (e.g. Figures 7 to 9) to have a first curved portion **608a** having a curvature on the side of said image sensor die **601a** and first and second memory dies **601b** attached as claimed to reduce Manufacturing costs (Column 8 Lines 3 to 11). (Although not shown, other memory dies could be attached via holes **633b**; see *ibid*). It would have been obvious to a person of ordinary skill in the art at the time of invention to have a first curved portion having a curvature on the side of said image sensor die and first and second memory dies attached as claimed as taught by Komiyama in the device of Hoffman and Tu et al. to reduce Manufacturing costs.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Glenn et al. (U.S. Patent No. 6,492,699) show a similar photo device as the instant invention and Akram et al. (U.S. Patent No. 6,165,817) teach to curve a insulating layer around the side of a die.

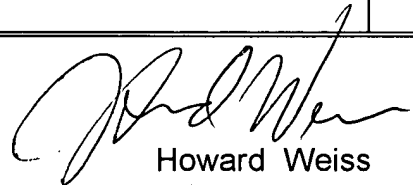
9. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.
10. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via Howard.Weiss@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705.

Art Unit: 2814

12. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/680	6/15/05
Other Documentation: PLUS Analysis Report	6/10/05
Electronic Database(s): EAST	6/15/05

HW/hw
16 June 2005


Howard Weiss
Primary Examiner
Art Unit 2814